

AQA Chemistry A-level

Topic 2.2 - Group 2

Flashcards



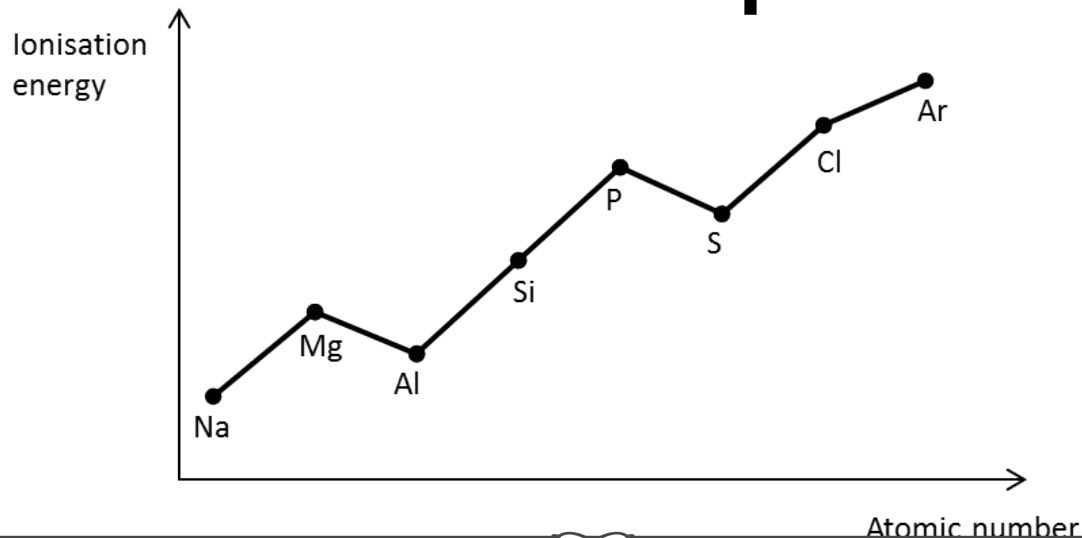
Write an equation for the
first ionisation energy of
magnesium



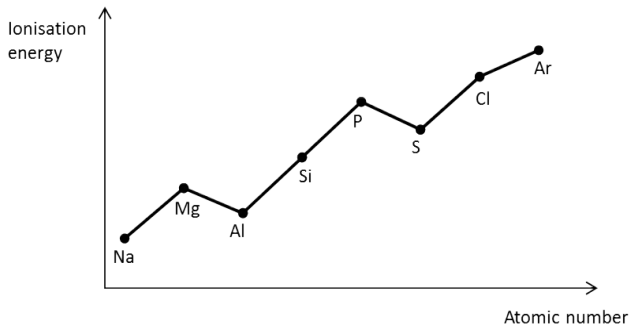
Write an equation for the first ionisation energy of magnesium



Explain why this graph is this shape:



Explain the shape of this graph:



First Ionisation energy increases across group 3 because of increased nuclear charge, decreased atomic radius and same electron shielding means more energy is needed to remove the first electron.

Dips at Al because: outer electron is in a 3p orbital, higher energy than 3s orbital
 → less energy needed to remove electron

Dips at S because one 3p orbital contains two electrons → repulsion between paired electrons
 → less energy needed to remove one



What happens to the first ionisation energy as you go down group 2? Why?



What happens to the first ionisation energy as you go down group 2? Why?

Decreases because: number of filled electron shells increases down the group → increased shielding, increased atomic radius → weaker force between outer electron and nucleus → less energy needed to remove electron



How does reactivity with water change as you go down group 2?



How does reactivity with water change as you go down group 2?

Increases (Mg least → Ba most)

Because outer electrons further from nucleus and more electron shielding, so electrons are lost more easily



Write an equation for the
reaction of Barium and
water



Write an equation for the reaction of Barium and water



Write an equation for the reaction of Magnesium and steam.



Write an equation for the reaction of Magnesium and steam.



What is the trend in
hydroxide solubility down
group 2?



What is the trend in hydroxide solubility down group 2?

Increases down the group

$\text{Mg}(\text{OH})_2$ is almost insoluble

$\text{Ba}(\text{OH})_2$ creates a strong alkaline solution



What is the trend in
sulphate solubility down
group 2?



What is the trend in sulphate solubility down group 2?

Decreases down group

MgSO_4 is soluble

BaSO_4 is insoluble



What is the trend in melting point down group 2? Why?



What is the trend in melting point down group 2?

Why?

Decreases down group

Because sea of delocalised electrons is further from the positive charge of the nucleus → weaker metallic bonds / forces of attraction which take less energy to weaken



What is the trend in atomic radius down group 2?



What is the trend in atomic radius down group 2?

Increases as there are more occupied electron shells down the group



Write the equations for the extraction of Titanium using Magnesium.



Write the equations for the extraction of Titanium using Magnesium.



What are flue gases?



What are flue gases?

Gases produced by power stations which are harmful to the environment



How can CaO or CaCO_3 be used to remove flue gases?
Write equations





How can CaO or CaCO_3 be used to remove flue gases? Write equations

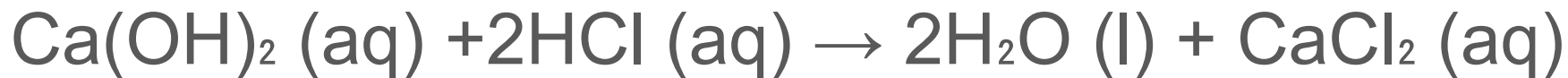


What is $\text{Ca}(\text{OH})_2$ used for?
Write an equation related to
one of its uses



What is $\text{Ca}(\text{OH})_2$ used for? Write an equation related to one of its uses

Used to neutralise soil



What is $\text{Mg}(\text{OH})_2$ used for?



What is $\text{Mg}(\text{OH})_2$ used for?

Milk of magnesia - antacid to treat indigestion, heartburn, wind etc.



What is a use of BaSO_4 ?
Why is this safe?



What is a use of BaSO_4 ? Why is it safe?

In barium meals to outline gut in X-rays

Ba^{2+} is toxic but is fine as barium sulphate is insoluble



How can BaCl_2 be used to
test for sulfate ions?



How can BaCl_2 be used to test for sulfate ions?

Add to sample with HCl , white ppt will form if sulfate ions present

